

IMPROVEMENT IN TURNING LATHES.

The manifest improvements which have been made of recent years in construction of American machinery are due in a very great measure to improved tools. Accuracy in the fitting-up and operation of every machine is dependent upon the tools employed to execute its various parts. Every improvement in tools, therefore, is a certain advance towards greater perfection in general mechanism, and is hailed by us with satisfaction. In such a spirit we present the accompanying illustrations and description of improvements in turning lathes, for which a patent was granted to Mr. William Sellers, of Philadelphia—the well-known tool manufacturer—on March 13, 1860.

Fig. 1 is a perspective view of the lathe, showing it applied with double slide-rest to dressing the tread of a pair of railroad carwheels, balanced on the axle. Fig. 2 is an end view of the lathe, with a vertical section of the poppet head; and Fig. 3 is a side section. Several

objects are embraced in this invention. The first is: Arranging the head which supports the revolving spindle in such a manner as to enable it to occupy a shorter space on the bed, and the same time increase the stiffness. Second, To place the centers which carry the work to be operated upon in such a position with reference to the bed-piece, that the strain of the cut shall fall within the line of the bed whilst that side of the work opposite the cutting tool may project beyond the line of the bed; as by so doing, the width of the bed-piece is reduced to the narrowest possible limits without impairing the stability. Third, Constructing the bed-piece and the heads attached to it in such a manner that the parallelism of the axis of the spindles in every direction may depend upon the truth of two surfaces of the bed with corresponding surfaces on the heads. Fourth, Constructing the upper surface of lathe-beds in such a manner that the slide-rest may move only on one-half of it, the other half being of similar form, so that the slide-rest may be transferred upon it, thereby enabling it to work upon any part of any piece, the lathe being capable of swinging, and this arrangement permits the use of a smaller slide-rest with advantage.

The bed-piece, A, has its upper surface horizontal and divided longitudinally into equal similar parts, *a a*, the edges of which are finished at such an acute angle with the upper side as to answer purposes that we shall hereafter describe. B B are heads carrying the line spindles of the lathe, when fitted for turning both wheels at the same time. In order to give these the greatest amount of rigidity with the least possible quantity of metal, they are made in the form of a hollow box, having the front and back ends united together by the side webs, *b b*, Fig. 3, as far up as the center of the revolving spindle; while they entirely surround the spindle of the dead-head when the latter is fitted for turning one wheel at a

time, thus greatly increasing the ability of the heads to resist the end thrust of any work that may be suspended on the centers to be operated upon. The heads are also enabled to be made shorter in the direction of the length of the bed than is possible by any of the methods in common use; the length of the bed is also diminished in the same proportion. In order to attach the heads, B B, to the bed-piece, A, a projection, C, Fig. 3, is provided and cast on the head, which corresponds with the side, *a'*, on the back of the bed-piece; and on the opposite side a piece, D, is provided, which is made to correspond

with the adjoining edge of the bed on one side and to fit against and rest on a projection, *d*, of the head on the other. The piece, D, is attached to the head, B, by means of the bolt, *e e e*, and one side resting on the projection, *d*, and the other against the bed-piece, while the middle is clear of any support. By tightening the bolts, *e e e*, the head will be forced over on that side until the projection, C, will allow it to go no further, and as the sides, *a' a'*, are at an acute angle with the surfaces, *a a*, of the bed, the head will then be forced against the

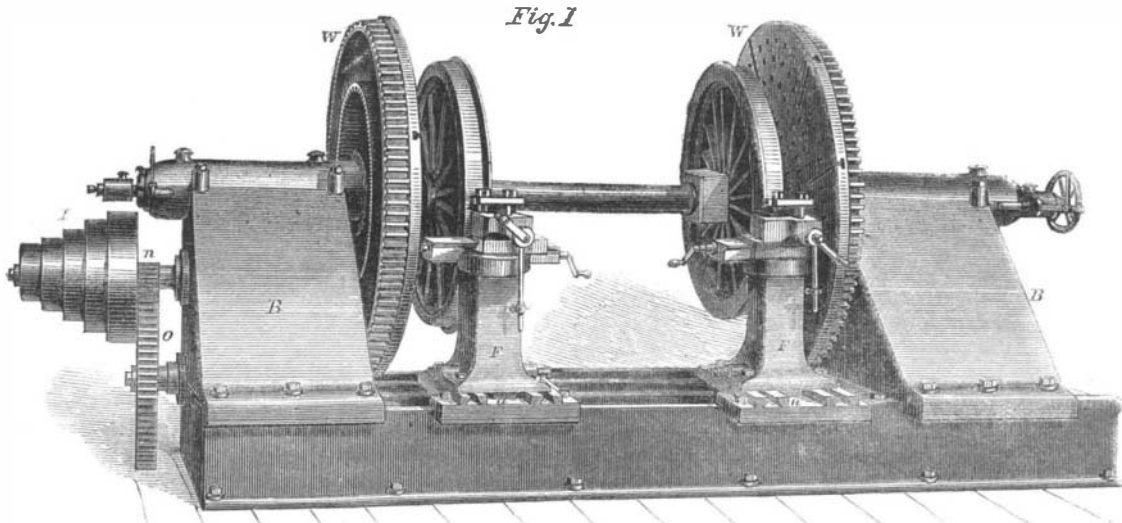
latter surfaces and held firmly in that position. In turning with a single slide-rest and cutter, as only one side of the work can be operated upon, the axis of the lathe spindles is placed as far to one side of the bed as possible, allowing the part of the work opposite the cutting tool to be beyond the line of the bed. To keep the lathe steady, the axis of the spindles is not carried beyond the bed entirely—only so far as may permit the center of gravity of the whole to fall within the base of the bed, thereby making use of the whole upper surface of the bed for the slide-rest to move upon. In ordinary turning lathes, that part of the bed beyond the line of centers for the slide-rest is useless for this purpose. The bottom plate, E, of the slide-rest is attached to the bed-piece in the same manner as the heads, B B, but it only embraces one-half of the upper side of the bed (one of the surfaces, *a a*). The slide-rest may be transferred from

one to the other of these—as they are both alike—according as the character of the work to be executed may require. The post, F, of the slide-rest is made capable of motion upon the bottom plate, E, in a direction at right angles to the bed-piece, A, for the purpose of adjusting the position of the cutting tool to the size of the work or article to be operated upon, and is moved by means of the pinion, T, gearing into rack, U; the bottom piece, E, is moved by means of a bar and rack in the bed-piece, A. P is the face-plate to which the work to be turned is attached. To give it motion, it is provided

with an external wheel, W, gearing with the pinion, *p*, Fig. 2. The latter is arranged so as to be placed out of or in gear with the wheel of the face-plate, by means of the clutch, *k*, which is operated by a wrench on the square end, *l*, of the clutch shaft, Fig. 3. The pinion, *p*, is driven by the shaft, *g*, Fig. 2, and it is fitted to slide on it easily. It is fitted to turn by a feather-key in the shaft; it is supported in position to gear with the wheel, W, by a projection, *m*, on the head, B. The outer end of shaft, *g*, has a gear wheel, O, upon it, which is driven by pinion, *n*, on a cone pulley, I. The latter turns freely on shaft, J, to which also it may be attached by the clutch-bolt, *t*, sliding in the plate, *z*, which is keyed fast on shaft, *j*. On the other end of this shaft is a pinion, S, which gears with the internal wheel, X, on the face-plate, P.

If the pinion, *p*, be placed out of gear with the external wheel, W, on the face-plate, P, and the clutch-bolt, *t*, be moved so as to attach the cone pulley, I, to the shaft, *j*, when the motion is communicated to the cone pulley the face-plate will be driven by the pinion, S. But if the clutch, *t*, be moved so that the cone pulley, I, shall be disengaged from the shaft, *j*, and the pinion, *p*, be placed in gear with the external wheel, W, on the plate, P, motion will be communicated to the latter through the pinion, *n*, wheel, O, shaft, *g*, and pinion, *p*; the pinion, S, and shaft, *j*, will thus be driven by the face-plate, which will have a slower motion than when driven by the pinion. The feeding of the cutting tool is accomplished by means of an eccentric on the end of each spindle, which works in the end of a slotted lever, thus giving the lever a reciprocating motion. These levers are connected to two small rockshafts overhead, and these again to the pawl wrenches shown on the slide-rest, by which arrangement an independent feed is given to each tool, and the amount of feed is determined by the position of the attachment on the pawl wrench and eccentric levers. The pawl wrenches can be placed on either screw of the slide-rest, so that we have a self-acting feed in every direction, and that without weakening the slide-rest by any internal arrangement of gearing. Beside the convenience in fitting-up the work by the combination of the internal and external wheel gearing on the same plate, the internal wheel, being cast with the plate, serves as a brace and renders it much stiffer than it would be without it.

Further information may be obtained by addressing Wm. Sellers & Co., Pennsylvania-avenue and Sixteenth-street, Philadelphia, Pa.



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